DOCUMENT RESUME

ED 194 217 PS 011 817

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TITLE Head Start Program and Cost Data Analysis: Final Report - Volume II.
INSTITUTION Development Associates, Inc., Arlington, Va.
SPONS AGENCY Department of Health, Education, and Welfare, Washington, D.C. Office of the Assistant Secretary for Planning and Evaluation.
PUB DATE Aug 79
CONTRACT 100-77-0108
NOTE 72p.: For Volume I, see ED 187 464.

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Compensatory Education: Compliance (Legal): *Eligibility: Federal Programs: *Population Distribution: *Program Costs: *Program Effectiveness: *Program Evaluation: Program Validation
IDENTIFIERS *Project Head Start

ABSTRACT

This second volume of the Head Start Program and Cost Data Analysis Final Report analyzes data from sources other than the Head Start Program Information Report (PIR). The report is divided into three sections: Distributional Impact of Head Start Financing, Pilot Study of Program Compliance, and Recommendations for Secondary Data Analysis. The appendix gives a description of the distributional impact data. Data from the U.S. Census Bureau's "Survey of Income and Education: 1975" were used to determine the number of children eligible to participate in the Head Start program for each state and federal region. The geographical distribution of the eligible population was then compared with the actual distribution of Head Start enrollees. In addition, an exploratory study of Head Start program compliance was conducted to determine if program compliance differs according to various program characteristics including costs per child, enrollment, size, child/staff ratios, and type of program. These data were collected by means of the Performance Standards Self-Assessment and Validation Instrument (SAVI). The SAVI is designed to assess compliance with Head Start performance standards for nearly 400 items in various areas of program operation (education, health services, social services, and the like). Recommendations for both the distributional impact and program compliance analyses are presented. (Author/SS)

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HEAD START PROGRAM AND COST DATA ANALYSIS:

FINAL REPORT - VOLUME II

Under Contract No. HEW-100-77-0108

Submitted To:

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

PS011817

Submitted By:

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2924 Columbia Pike
Arlington, Virginia 22204

August 1979

DEC 4 1980

This report is made pursuant to Contract No. HEW-100-77-0108. The amount charged to the Department of Health, Education, and Welfare for the work resulting in this report (inclusive of the amounts so charged for any prior reports submitted under this contract) is approximately $159,037. The names of the persons employed or retained by Development Associates with managerial or professional responsibility for this project and this report are listed below:

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PREFACE

Volume II of the "Head Start Program and Cost Data Analysis Final Report" represents the study's analytical efforts to utilize data from "secondary" sources, i.e., sources other than the Head Start Program Information Report (PIR). Volume I reports the results of the 1976/1977 PIR data analyses, and it is the primary thrust of this study. Volume II represents more of an exploratory analysis of Head Start programs operating within a socioeconomic context.

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CHAPTER I

INTRODUCTION

An important component of the "Head Start Program and Cost Data Analysis" study is to explore and utilize effectively secondary data from sources other than the Head Start Program Information Report (PIR). One such source is the U.S. Census Bureau's Survey of Income and Education: 1975, which contains population data on the number of preschool children in families below the poverty level by state. These data are used in this report to measure the number of children eligible to participate in the Head Start program for each state and federal region. The geographical distribution of eligible population is compared then with the actual distribution of Head Start enrollees in Chapter II.

Another important secondary data source is the Performance Standards Self-Assessment and Validation Instrument (SAVI), submitted by each grantee to its respective regional office. The SAVI has been designated to assess compliance with Head Start performance standards for nearly 400 items in various areas of program operation (education, health services, social services, etc.). Chapter III in this report presents a pilot, exploratory study of program compliance that attempts to determine if program compliance differs according to various program characteristics including costs per child, enrollment size, child/staff ratios, and type of program. Part of the exploratory nature of this pilot analysis is due to the fact that SAVI data are analyzed for only 58 grantees. Another cause for the exploratory nature is that the SAVI was not designed originally for the analysis presented in Chapter III.

CHAPTER II

DISTRIBUTIONAL IMPACT OF HEAD START FINANCING

Head Start is a child development program targeted primarily on disadvantaged preschool children and their families. As such, a relevant question concerns the extent to which the actual distribution of Head Start resources coincides with the targeted population. This section combines state aggregate PIR data with data from selected secondary statistical sources in order to examine this topic.

This section deals with two broad questions: (1) Who receives the greatest share of Head Start benefits?; and (2) To what extent does Head Start reach its "target" population of disadvantaged preschool children? Measures of Head Start resources which are derived from the PIR data include: number of Head Start recipients; total ACYF funding; and Head Start expenditures per child. An important qualification to these measures is that they refer to the distribution of program measures rather than to actual benefits received by Head Start children. However, it is plausible that the amount of Head Start benefits provided would be positively related with these variables.

A. Tabular Analysis of the Distribution of Head Start Resources

The PIR data have been used to construct totals at the state level for both ACYF funding and ACYF enrollment. These aggregates may be used to determine which states and geographical regions receive more ACYF resources relative to others.

Determining whether a state has received "relatively more or less" ACYF resources requires that certain initial benchmarks be established. One such benchmark would be the population of preschool children in a given state. A state could be targeted to receive relatively more ACYF resources if it has a greater population of preschool children. Another benchmark would be the proportion of a state's preschool population in poverty. A state could be targeted to receive relatively more ACYF resources if its poverty share of preschool children is greater. Both benchmarks have been used in this report. Specifically, we have compared each federal region's share of ACYF funding and ACYF enrollment with: (1) its share of children 3 to 5 years of age*; and (2) the percent of its preschool children who are in poverty. The intent here is to state similarities and differences in these comparisons, but not to render any policy recommendation on the basis of the comparisons or to imply departures or fulfillment of policy objectives.

*See Appendix A for a description of the secondary data sources used in this analysis.

Tables II-1 through II-3 show overall a fairly good correspondence between the geographic distribution of ACYF resources and the respective distributions of both preschool children and the number of preschool children in poverty. These tables also reveal some noteworthy discrepancies between these compared distributions. Certain federal and geographic regions benefit more from Head Start than others, both in comparison to population and shares of children in poverty. This is particularly true for federal Region IV and the South in general. Conversely, other regions receive relatively fewer benefits. In particular, Region V or the Northeast and North Central states receive a substantially less share of ACYF resources warranted by population sizes and poverty shares.

In general, deviations between ACYF enrollment/funding shares and regional shares of children in poverty are smaller than the deviations between ACYF enrollment/funding shares and regional shares of population. Overall though, the evidence strongly suggests that the size of the target group is taken into account in determining how ACYF resources are distributed among regions.

B. Correlational Analysis of ACYF Enrollments, Funding, and Measures of Need

The influence of regional need on the distribution of both ACYF enrollments and funding may also be examined through the statistical techniques of correlation and regression analysis. Table II-4 shows the ranking of each of the states on the basis of ACYF enrollments, ACYF funding, and number of children 3-5 years in poverty. If the number of children in poverty is an important determinant of ACYF funding and enrollment, the rank of the state in columns (1) and (2) should be systematically related to the rank in column (3). "High" ranks in columns (1) and (2) should be accompanied by "high" ranks in column (3), and conversely, "low" ranks in columns (1) and (2) should accompany "low" ranks in column (3).

Statistical indexes have been developed for concisely describing such relationships. These are correlation coefficients. Typically, correlation coefficients may assume values between (+1) and (-1). A correlation coefficient equal to (+1) would occur if there were a perfect positive relationship between two variables. This would occur, for example, if the rank in column (3) were identical to the rank in either column (1) or column (2). A correlation coefficient value of (-1) would occur if there were a perfect negative relationship between two variables. This would occur, for example, if the state ranked 1st in column (1) ranked 51st in column (3), the state ranked 2nd in column (1) ranked 50th in column (3), and so forth. A correlation coefficient of 0 would indicate that there was no systematic relationship, positive or negative, between two variables. Correlation values between 0 and (+1) or 0 and (-1) would indicate varying degrees of positive or negative relationship, respectively, between two variables.

TABLE II-1

COMPARISON OF THE PERCENT OF ACYF ENROLLMENT IN EACH REGION* WITH THE DISTRIBUTION OF PRESCHOOL CHILDREN

Federal Region	Total ACYF Enrollment (100's)	Percent of Total	Total Number of Children Less Than 5 Years of Age (1000's)	Percent of Total	Total Number of Preschool Children in Poverty (10's)	Percent of Total U.S.
Region 1	104	3.7%	804	5.1%	8,059	4.8%
Region 2**	218	7.7	1,712	10.8	17,316	10.2
Region 3	201	7.1	1,662	10.5	15,385	9.1
Region 4	801	28.3	2,730	17.2	35,438	20.9
Region 5	433	15.3	3,388	21.4	32,333	19.1
Region 6	454	16.1	1,856	11.7	24,858	14.7
Region 7	170	6.0	818	5.2	6,780	4.0
Region 8	107	3.8	521	3.3	3,909	2.3
Region 9	269	9.5	1,835	11.6	21,014	12.4
Region 10	71	2.5	519	3.3	4,118	2.4
Total	2,830	100%	15,845	100%	169,210	100%

* Note HEW geographic regions. PIR respondents from IMPD are now counted in the region where the programs operate.

** Does not include Puerto Rico.

TABLE II-2

COMPARISON OF THE PERCENT OF ACYF FUNDS RECEIVED BY EACH REGION* WITH THE DISTRIBUTION OF PRESCHOOL CHILDREN

Federal Region	Total ACYF Funding ($100,000)	Percent of Total U.S.	Total Number of Children Less Than 5 Years of Age (1000's)	Percent of Total U.S.	Total Number of Preschool Children in Poverty (10's)	Percent of Total U.S.
Region 1	134	3.9%	804	5.1%	8,059	4.6%
Region 2	323	9.3	1,712	10.8	17,316	10.2
Region 3	322	9.3	1,662	10.5	15,385	9.1
Region 4	987	28.5	2,730	17.2	35,438	20.9
Region 5	487	14.1	3,388	21.4	32,333	19.1
Region 6	457	13.2	1,856	11.7	24,858	14.7
Region 7	173	5.0	818	5.2	6,780	4.0
Region 8	146	4.2	521	3.3	3,909	2.3
Region 9	335	9.7	1,835	11.6	21,014	12.4
Region 10	96	2.8	519	3.3	4,118	2.4
Total	3,458	100%	15,845	100%	169,210	100%

*Note HEW geographic regions. PIR respondents from IMPD are now counted in the region where the programs operate.

TABLE II-3

COMPARISON OF ACYF RESOURCES AND PRESCHOOL CHILDREN,
BY BROAD GEOGRAPHIC REGIONS

	Total ACYF Enrollment (100's)	Percent of Total U.S.	Total ACYF Funding ($100,000)	Percent of Total U.S.	Total No. Children Less Than 5 Years of Age (1000's)	Percent of Total U.S.	Total No. Children 3-5 Years of Age in Poverty (1000's)	Percent of Total U.S.
Northeast	400	14.1%	$588	17.0%	3,298	20.8%	327.94	19.3%
North Central	624	22.1	688	19.9	4,307	27.1	399.31	23.6
South	1,339	47.3	1,595	46.0	5,363	33.8	665.98	39.4
West	467	16.5	586	16.9	2,877	18.2	298.87	17.7
U.S. Total	2,830	100%	3,457	100%	15,845	100%	1,692.10	100%

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TABLE II-4

STATES RANKED BY ACYF ENROLLMENT, ACYF FUNDING, AND NUMBER OF PRESCHOOL CHILDREN IN POVERTY*

STATE	(1) ACYF Funding Rank (Hi to Lo)	(2) ACYF Enrollment Rank (Hi to Lo)	(3) Preschool Poverty Population Rank (Hi to Lo)
Alabama	9	11	13
Alaska	41	46	51
Arizona	18	18	26
Arkansas	24	17	20
California	2	3	1
Colorado	21	23	33
Connecticut	43	35	29
Delaware	48	46	48
D.C.	32	40	40
Florida	8	7	7
Georgia	22	20	8
Hawaii	40	42	44
Idaho	42	41	42
Illinois	5	5	4
Indiana	25	23	19
Iowa	34	30	34
Kansas	32	33	35
Kentucky	13	10	16
Louisiana	11	12	12
Maine	37	39	38
Maryland	29	31	25
Massachusetts	17	22	14
Michigan	20	14	9
Minnesota	28	26	27
Mississippi	1	1	15
Missouri	12	8	17
Montana	36	36	39
Nebraska	37	36	36
Nevada	49	50	47
New Hampshire	46	48	45
New Jersey	13	18	10
New Mexico	30	25	30
New York	3	4	3
North Carolina	10	9	11
North Dakota	45	44	49
Ohio	7	6	5
Oklahoma	16	15	23
Oregon	35	34	32
Pennsylvania	6	13	6
Rhode Island	46	44	41
South Carolina	18	20	24
South Dakota	44	42	43
Tennessee	15	16	21
Texas	4	2	2
Utah	37	36	37
Vermont	51	51	46
Virginia	23	28	18
Washington	31	32	28
West Virginia	25	28	31
Wisconsin	25	27	22
Wyoming	49	48	50

*Included are the 50 states plus the District of Columbia.

Correlation coefficients may be computed between the ranks of variables. These are called rank-order correlations. Correlations may also be computed between the numerical values of variables. These are called Pearson product moment coefficients of correlation. Because Pearson coefficients take into account the numerical magnitude of differences between observations as well as the rank order, we calculated the Pearson coefficient only. These coefficients, displayed in Table II-5, measure the relationship between state ACYF enrollment and funding and selected indexes of need.

The correlation coefficients in column (1) of Table II-5 indicate that there is a strong positive relationship between both ACYF enrollments and funding and the number of poor children in each state. That is, states with larger numbers of poor preschool children are also likely to receive larger amounts of ACYF funding and have larger ACYF enrollment. The correlation coefficients in column (2) reveal a weaker, though still significantly positive relationship between both ACYF enrollments and funding and the poverty rate among preschool children. The poverty rate measure used in Table II-5 is the percent of preschool children (3 to 5 years of age) within a given state who are at or below the poverty level. This variable "automatically" controls for variations in population sizes among states.

We also experimented with two additional measures of need based on infant mortality rates. The correlations between these measures and ACYF enrollment and funding are presented in columns (3) and (4). Standard statistical tests show that these measures do not differ significantly from zero. Number of AFDC (Aid to Families with Dependent Children) recipients, on the other hand, has a high degree of positive correlation with either ACYF enrollment or funding. Also, the correlation coefficient between AFDC recipients and the poverty population is a very high .91 (not shown in Table II-5). Hence, the AFDC measure would make a good predictor of the SIE measure.

The results point to two general conclusions. First, states with greater numbers of preschool children in poverty are likely to receive more ACYF resources. Second, states in which poverty among preschool children is more intense, that is, in which a larger fraction of children are poor, are also likely to receive more ACYF benefits.

C. Regression Analysis of the Determinants of ACYF Enrollment and Funding by State

The descriptive statistics in Tables II-1 through II-3 indicate substantial geographic variation in the allocation of ACYF funds and enrollments. Evidence has also been presented that some of this variation is attributable to state differences in poverty among preschool children. In this section we use regression analysis to quantitatively analyze the determinants to ACYF enrollment and funding.

TABLE II-5

CORRELATION BETWEEN ACYF ENROLLMENT, ACYF FUNDING, AND SELECTED MEASURES OF NEED FOR THE 50 STATES AND THE DISTRICT OF COLUMBIA

Head Start Benefit Measures	(1) Number of Preschool Children in Poverty	(2) Percent of Preschool Children in Poverty (within a state)	(3) White Infant Mortality Rate	(4) Non-White Infant Mortality Rate	(5) AFDC Recipients
ACYF Enrollment	.805**	.532**	-.05	.20	.675**
ACYF Funding	.789**	.498**	-.04	.20	.706**

**Denotes that the correlation coefficient is significantly different from 0 at the .05 level.

Regression analysis permits one to examine the relationship between one variable, referred to as the dependent variable, and several other variables, referred to as independent variables. In our case, the relevant dependent variables are ACYF enrollments and ACYF funding by state, while the independent variables are: (a) number of children 3-5 years old in poor families; (b) percent of children 3-5 years old in poor families; (c) per capita spending for local public education; (d) per capita public welfare spending; and (e) per capita public spending on health. The per capita spending variables were included in addition to the poverty measures in order to examine whether ACYF funding and enrollment were related to state and local spending in areas ancillary to Head Start.

The results of the regression analysis are presented in Tables II-6 and II-7. The R^2 statistic at the bottom of each table measures the proportion of the variation in the dependent variable due to variation in the independent variables. Thus, the results indicate that 75 percent of the variation in ACYF enrollment among states (Table II-6) and 70 percent of the variation in ACYF funding (Table II-7) is due to variation in the independent variables.

The results of the estimated regression coefficients also indicate that both the number of preschool children in poverty and the poverty rate among preschool children are statistically significant determinants of ACYF enrollment and funding while state and local per capita spending variables are not. More specifically, the results imply that states with larger poverty populations receive more ACYF funding and have larger ACYF enrollments, holding other factors constant. The estimated coefficient of the poverty population variable in Table II-6 (i.e., .01) indicates that ACYF enrollments rise by one child for a ten children increase in the preschool poverty population. Similarly, the estimated coefficient of the same variable in Table II-7 (i.e., .012) indicates that ACYF funding increases by $1,200 for each increase in the preschool poverty population by ten.

Similarly, if two states are equal in all respects except for the percent of preschool children in poverty, the state with the higher poverty rate would receive more ACYF resources. The estimated coefficient of the poverty rate variable in Table II-6 (277.3) indicates that the ACYF enrollments rise by roughly 2,770 for each increase in the preschool poverty rate of one percent. The estimated coefficient of the poverty rate variable in Table II-7 (324.26) indicates that each one percent increase in the preschool poverty rate increases ACYF funding by roughly $324,000.

Thus, the regression results indicate that state variation in poverty among preschool children explains a substantial part of the state variation in both ACYF funding and ACYF enrollment. Specifically, both ACYF funding and ACYF enrollment are related positively to state preschool poverty populations and poverty rates.

TABLE II-6
REGRESSION ESTIMATES FOR
ACYF ENROLLMENT (100's OF CHILDREN)

Independent Variable	Estimated Regression Coefficient
Number of Children 3-5 Years of Age in Poverty (10's of Children)	.0106** (9.06)
Percent of Children 3-5 Years of Age in Poverty	277.3** (3.18)
Per Capita Public Spending on Local Education	-.0399 (.538)
Per Capita Public Welfare Spending	-.0948 (1.25)
Per Capita Public Spending on Health	.0884 (.505)
R^2	.7535

The t-statistics are in parentheses.

** Denotes that the regression coefficient differs statistically from 0 at the .05 level.

TABLE II-7
REGRESSION ESTIMATES FOR
ACYF FUNDING ($100,000)

Independent Variable	Estimated Regression Coefficient
Number of Children 3-5 Years of Age in Poverty (10's of Children)	.0126** (7.89)
Percent of Children 3-5 Years of Age in Poverty	324.3** (2.7)
Per Capita Public Spending on Local Education	-.021 (.20)
Per Capita Public Welfare Spending	-.063 (.606)
Per Capita Public Spending on Health	.212 (.88)
R^2	.703

The t-statistics are in parentheses.

** Denotes that the regression coefficient differs statistically from 0 at the .05 level.

D. Accessibility of Head Start

The analysis has thus far only partially addressed the issue of accessibility of Head Start to disadvantaged preschool children. Accessibility pertains to both the comprehensiveness and intensity of the program. Comprehensiveness may be measured by the proportion of eligible disadvantaged children who participate in Head Start, whereas intensity may be measured by the level of services provided to each recipient.

1. Comprehensiveness of Head Start

A reasonable measure of comprehensiveness is the ratio of ACYF enrollees to the number of preschool children in poverty which can be labelled as the Head Start coverage rate*. The value of this ratio for each state is presented in Table II-8. Roughly 20 percent of the U.S. preschool poverty population is enrolled in Head Start, ranging from a low of seven percent in Vermont to a high of 67 percent in Mississippi.

Table II-9 presents the coefficient of correlation between the ACYF coverage rate and selected measures of need. The correlations indicate that the ACYF coverage rate is significantly lower in states with relatively large numbers of preschool children in poverty. This suggests that while states with large preschool poverty populations receive more ACYF funding, the funding increment does not fully compensate for the larger population of needy children. The negative correlations between the coverage rate and both welfare spending variables (local and state welfare spending per capita and AFDC outlays) may be interpreted in two ways. Higher welfare spending in a particular state may reflect the presence of a larger poverty population. In this case, the ACYF coverage rate would be negatively correlated with welfare measures coincidentally in the same manner that is negatively correlated with the population of poor children.

In contrast to the negative correlation between the coverage rate and AFDC welfare spending, the correlation coefficient between AFDC welfare spending and the preschool poverty population is .7. Hence, the AFDC measure is a fair predictor of the population eligible for Head Start. The correlation coefficient between local and state welfare spending per capita and the preschool poverty population is only .22. These results may suggest that some degree of substitution between Head Start funds and other welfare funds exist at state and local levels.

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*It should be noted that approximately only 90 percent of ACYF enrollees are at or below the poverty level. However, many of the enrollees in the other ten percent are handicapped children. Also, the PIR data on total enrollment is more reliable than the data on enrollees at or below the poverty level.

TABLE II-8

RATIO OF ACYF ENROLLMENTS TO PRESCHOOL POVERTY POPULATION

STATE	ACYF Enrollments Number of Children 3-5 Years of Age in Poverty
Alabama	0.2
Alaska	0.43
Arizona	0.267
Arkansas	0.23
California	0.11
Colorado	0.348
Connecticut	0.12
Delaware	0.25
D.C.	0.23
Florida	0.14
Georgia	0.08
Hawaii	0.22
Idaho	0.24
Illinois	0.126
Indiana	0.149
Iowa	0.241
Kansas	0.22
Kentucky	0.24
Louisiana	0.165
Maine	0.23
Maryland	0.132
Massachusetts	0.119
Michigan	0.121
Minnesota	0.198
Mississippi	0.67
Missouri	0.28
Montana	0.245
Nebraska	0.177
Nevada	0.119
New Hampshire	0.144
New Jersey	0.109
New Mexico	0.246
New York	0.134
North Carolina	0.18
North Dakota	0.319
Ohio	0.127
Oklahoma	0.322
Oregon	0.135
Pennsylvania	0.105
Rhode Island	0.142
South Carolina	0.26
South Dakota	0.223
Tennessee	0.27
Texas	0.148
Utah	0.186
Vermont	0.07
Virginia	0.109
Washington	0.135
West Virginia	0.236
Wisconsin	0.145
Wyoming	0.384
National Mean	0.204
Standard Deviation	0.101

TABLE II-9

CORRELATION COEFFICIENTS BETWEEN THE ACYF COVERAGE RATE AND SELECTED VARIABLES

Variable	Correlation Coefficient
Number of Children 3-5 Years of Age in Poverty	-.336**
Percent of Children 3-5 Years of Age in Poverty	.173
Per Capita Local and State Public Spending on Welfare	-.258*
Federal AFDC*** Outlays	-.326**
Per Capita Public Spending on Local Education	.052

* Denotes that the correlation coefficient differs significantly from 0 at the .10 level.

** Denotes that the correlation coefficient differs statistically from 0 at the .05 level.

*** AFDC: Aid to Families with Dependent Children.

Variations in the coverage rate by state were also applied to regression analysis. The results, presented in Table II-10, show that roughly 73 percent of the variation in ACYF coverage rates is explained by variations in: ACYF funding; preschool poverty population; per capita public spending on local schools; per capita welfare spending; per capita public spending for health; and the percent of preschool children in poverty.

The regression coefficient of the ACYF funding variable may be of particular relevance for public policy in that it permits one to estimate the increased costs required to expand the coverage of Head Start. Specifically, the results imply that the ACYF coverage ratio would rise by .00018 if ACYF funding rose by $100,000. At the mean of the sample, this implies that increasing ACYF funding by 2.6 times would roughly double the ACYF coverage ratio. The other relations between the independent variable and the dependent variable correspond to the correlation coefficients in Table II-9 described previously.

2. Intensity of Head Start

One measure of Head Start's intensity in a particular state or region is the amount of ACYF funding per enrollee. These amounts are presented in Table II-11. The U.S. average amount of ACYF funding per enrollee is $1,278 ranging from a low amount of $880 in Arkansas to a high amount of $2,250 in Alaska.

Table II-12 presents correlation coefficients between the Head Start intensity measure and measures of both need and per capita local spending. The results do not show a positive relationship between need and Head Start intensity. Instead, the preschool poverty population and the percent of preschool poverty are both negatively correlated, though weakly, with ACYF funding per enrollee. However, there is a significant, positive relationship between ACYF funding per enrollee and per capita local spending variables.

This positive relationship may be due to several factors. Salaries paid to public employees, in particular public school teachers, are likely to serve as a reference for salaries of ACYF-paid staff. Since higher salaries would be associated with higher per capita spending levels, the positive correlation between ACYF funding per enrollee and per capita spending on education in Table II-12 may simply reflect the influence of regional salary variations on the cost per enrolled child. However, it is also possible that the level of Head Start services provided per child may be set with reference to the level of other public services per capita in the community. Under this view, the positive correlations imply that Head Start intensity is higher in communities with higher per capita spending on related public services.

TABLE II-10

REGRESSION ESTIMATES FOR ACYF COVERAGE RATES

Independent Variable	Estimated Regression Coefficient
Total ACYF Funding ($100,000)	.0018** (8.5)
Number of Children 3-5 Years of Age in Poverty (10's of Children)	-.000035** (9.6)
Per Capita Public Spending on Local Education	.00046** (3.04)
Per Capita Public Welfare Spending	-.00034** (2.23)
Per Capita Public Spending on Health	-.0000032 (0.0)
Percent of Children 3-5 Years of Age in Poverty	.094 (.5)
R^2	.73

The t-statistics are in parentheses.

** Denotes that estimated coefficient differs significantly from 0 at the .05 level.

TABLE II-11

ACYF FUNDING PER ENROLLED CHILD

State	Amount	State	Amount
Alabama	$1,360	Montana	$1,350
Alaska	2,250	Nebraska	1,170
Arizona	1,200	Nevada	1,600
Arkansas	880	New Hampshire	1,600
California	1,220	New Jersey	1,470
Colorado	1,480	New Mexico	902
Connecticut	1,360	New York	1,480
Delaware	1,250	North Carolina	1,180
D.C.	2,200	North Dakota	1,440
Florida	1,270	Ohio	1,180
Georgia	1,120	Oklahoma	960
Hawaii	1,580	Oregon	1,180
Idaho	1,210	Pennsylvania	1,670
Illinois	1,200	Rhode Island	1,220
Indiana	1,040	South Carolina	1,240
Iowa	1,060	South Dakota	1,250
Kansas	1,320	Tennessee	1,150
Kentucky	1,000	Texas	989
Louisiana	1,170	Utah	1,170
Maine	1,250	Vermont	1,330
Maryland	1,410	Virginia	1,660
Massachusetts	1,470	Washington	1,340
Michigan	909	West Virginia	1,300
Minnesota	1,070	Wisconsin	1,270
Mississippi	1,300	Wyoming	1,140
Missouri	890	U.S.	1,278

Mean(U.S.) = $1,278

Standard Deviation = $ 282

TABLE II-12

CORRELATION BETWEEN ACYF FUNDING
PER ENROLLEE AND SELECTED VARIABLES

Variable	Correlation Coefficient
Number of Children 3-5 Years of Age in Poverty	-.154
Percent of Children 3-5 Years of Age in Poverty	-.216*
Per Capita Public Spending on Local Education	.494**
Per Capita Public Welfare Spending	.405**
Per Capita Public Spending on Health	.324**

*Denotes that correlation coefficient differs significantly from 0 at the .10 level.

**Denotes that correlation coefficient differs significantly from 0 at the .05 level.

The determinants of ACYF funding per enrollee were also analyzed through regression analysis. The results in Table II-13 indicate that the variables included in the regression explain 41 percent of the state variation in ACYF funding per enrollee. The estimated coefficient of the ACYF funding variable implies that other things equal, ACYF funding per child decreases by $129 per each additional $100,000 of ACYF funding. The coefficient of the poverty population variable implies that, other things equal, ACYF intensity is lower in states with larger populations of eligible children. This may suggest that trade-offs are made between serving more children versus serving more per child. In addition, each of the coefficients of the per capita education and welfare spending variables indicates that, other things equal, ACYF funding per enrollee is higher in states with higher levels of spending for related public services. Finally, the statistical insignificance of the poverty rate variable implies that Head Start intensity is not related to the percent of preschool children in poverty.

E. Conclusions

This chapter combines the PIR data with selected secondary data sources in order to analyze the distribution of Head Start resources. Several conclusions emerge from this analysis:

1. Certain states and federal regions receive either substantially more or substantially less Head Start benefits in relation to both their preschool populations and the percent of their preschool population in poverty. Overall, though, the distributions of Head Start resources and the targeted population correspond well with each other.

2. In large part, the differences between the distribution of ACYF resources and the distribution of preschool children is due to an implicit allocation of both ACYF enrollments and ACYF funding on the basis of need. Specifically, both the size of the eligible population (preschool children in poverty) and the percent of the preschool population that is eligible (preschool poverty rate), have a significant positive impact on ACYF funding and enrollment. However, it should be noted that certain regions receive disproportionately more or disproportionately less ACYF resources relative to their needs. In particular, Region IV receives a share of both ACYF funding and enrollment that significantly exceeds its share of the eligible population, while Region V receives a share of ACYF resources that is less than its eligible population.

TABLE II-13

REGRESSION ESTIMATES FOR ACYF FUNDING PER ENROLLEE

Independent Variable	Estimated Regression Coefficient
Total ACYF Funding ($100,000)	-.00129* (1.44)
Number of Children 3-5 Years of Age in Poverty	-.000036** (2.39)
Percent of Children 3-5 Years of Age in Poverty	-.447 (.58)
Per Capita Public Spending on Local Education	.0016** (2.66)
Per Capita Public Welfare Spending	.0013 (2.08)
Per Capita Public Spending on Health	.0018 (1.22)
R^2	.41

The t-statistics are in parentheses.

*Denotes that coefficient differs from 0 at the .10 level

**Denotes that coefficient differs form 0 at the .05 level

3. At current funding levels, Head Start is accessible to approximately 20 percent of the eligible population. Other things equal, Head Start accessibility is lower in states with larger populations of eligibles. This suggests that Head Start funding increments to states with large poverty populations are not enough to compensate for the larger population of needy children that could be served by Head Start.

4. The intensity of Head Start benefits does not increase with need. Indeed, ACYF funding per enrollee is lower in states with larger populations of eligibles. This suggests that, other things equal, decision makers may trade-off higher enrollment levels against higher spending per enrollee. However, ACYF spending per child is significantly higher in states with higher per capita public spending levels for health and education.

CHAPTER III

PILOT STUDY OF PROGRAM COMPLIANCE

This chapter demonstrates how data from the PIR may be combined with responses to the Self-Assessment and Validation Instrument (SAVI) in order to analyze the determinants of compliance with certain Head Start program objectives. Specifically, this section analyzes the relationships between compliance and program characteristics and between compliance and program costs.

A. Applicability and Limitations of the SAVI Data

The compliance measure used in the analysis is based on a sample of responses to the SAVI. The SAVI is designed to assess compliance with Head Start performance standards in six program areas:

- Education;
- Health Services: General, Medical and Dental;
- Health Services: Mental Health;
- Health Services: Nutrition;
- Social Services; and
- Parent Involvement.

In each program area, compliance is measured in terms of whether the grantee or delegate agency has met or exceeded all parts and sub-items of the relevant performance criteria. The grantee or agency is then deemed to be "in compliance" if activities in each program component meet the Head Start performance standards.

For purposes of analysis, a sample of approximately eighty (80) SAVI reports was drawn from the regional offices. This sample contained reports representing different degrees or categories of compliance. The process of merging this sample with the relevant PIR data, as well as the presence of missing PIR cases, ultimately reduced this sample in size to fifty-eight (58) cases. The findings of this chapter are based on an analysis of these 58 cases.

Before discussing the results of the analysis, it is appropriate to identify some important limitations of the data. First, the cases examined were not selected through formal sampling procedures. Therefore, they are unlikely to be representative of Head Start programs as a whole.

Second, while responses to SAVI items measure compliance with certain performance standards, they do not necessarily measure success in meeting analogous Head Start program goals. For example, the cognitive skills of enrollees may or may not be greater in a program that is in compliance with the education component of the SAVI than if it were not. This suggests that analysis of the relationships between program compliance and selected program characteristics may or may not provide insight about the impact of these characteristics on program effectiveness. In the absence of accurate measures of impact on children or effectiveness, SAVI compliance may serve as a proxy variable. However, compliance is neither a sufficient or even necessary condition for effectiveness.

Another limitation arises from the need to aggregate the numerous "yes/no" responses of the SAVI into single measures of compliance. The compliance index used in this analysis is based on the frequency of "yes" responses. Under this approach, a program component area in full compliance (all yes responses) would receive a compliance score of 1. A program component area in total noncompliance (all no responses) would receive a compliance score of 0. Component areas with some "yes" and some "no" responses would receive index values between 0 and 1.

An attractive feature of this index is its ease of interpretation. However, it has the unattractive feature of assigning an equal weight to each SAVI item. For example, a "no" response to the SAVI question pertaining to development of intellectual skills would have the same impact on a program's compliance score as a "no" response to the SAVI question pertaining to availability of battery flashlights for emergency lighting power. Problems of this sort are a serious limitation of a simple compliance score. However, in the absence of attempts to assign different weights to the SAVI items, the only alternative is to assign equal weights, explicitly or implicitly to the SAVI items.

Since the SAVI data have important limitations, the findings presented in the following sections should be viewed as preliminary rather than definitive. However, the SAVI is presently the only available source of data that can be used to analyze the relationships between compliance and program characteristics and/or costs. Moreover, the results obtained are of sufficient interest to justify the analysis and point to relationships that merit further examination with expanded and improved data sets.

B. Summary Statistics

Descriptive statistics constructed from the file of 58 SAVI/PIR cases are presented in Tables III-1 and III-2. Table III-1 compares selected program and cost characteristics of the sample with corresponding characteristics of the population of Head Start programs computed from the PIR data. These statistics indicate that the 58 case sample is unrepresentative of all Head Start programs in several respects. In particular, programs in non-SMSA's are

TABLE III-1

COMPARISON OF SELECTED CHARACTERISTICS OF THE 58 CASE SAVI/PIR SAMPLE WITH CORRESPONDING CHARACTERISTICS OF HEAD START PROGRAMS AS A WHOLE

Characteristic	Value in 58 Case Sample	Value Among Head Start Programs as a Whole
Percent of cases in SMSA's	39.7%	42.7%
Percent of cases that are full-day (or both) programs	24.1%	23.0%
Average Enrollment	222	303
Average number of paid staff	43	58
Percent of Total staff with CDA, BA Degrees	13.4%	11.2%
Average Child to Staff Ratio	4.6	5.2
Average cost per enrolled child	$2,081	$1,900
Percent of grantees with delegates	0%*	17.6%

*The discrepancy between PIR reports which include both grantees and delegate respondents separately and SAVI reports which encompass grantees and their respective delegates on an aggregate or cumulative basis only presents a complication for matching analytically the two respective reports. Hence, for this pilot analysis the few grantees with delegates in the original sample of 80 were excluded from the analysis.

TABLE III-2

RATIOS OF SAVI ITEMS IN COMPLIANCE

	Mean	Standard Deviation	Skewness
Ratio of all items in compliance	.827	.155	-1.265
Ratio of all program items in compliance	.842	.150	-1.493
Ratio of all written items in compliance	.769	.258	-1.440
Ratio of all education program items in compliance	.837	.168	-1.618
Ratio of all general health program items in compliance	.865	.212	-2.617
Ratio of all mental health program items in compliance	.745	.358	-1.272
Ratio of all nutrition program items in compliance	.838	.211	-2.099
Ratio of all social services program items in compliance	.789	.290	-1.608
Ratio of all parent participation program items in compliance	.761	.305	-1.320

overrepresented, along with larger programs, and programs with higher costs per child.

Table III-2 presents selected descriptive statistics of the various SAVI compliance items.* Among the measures of total compliance, written compliance has both the lowest mean ratio (.769) and the highest standard deviation around that ratio (.258). Among the various separate program areas, the average compliance ratio is lower in the areas of mental health (.745), social services (.789), and parent participation (.761) than it is in education (.837), general health (.865), and nutrition (.838). The variability of the compliance ratio, measured by the standard deviation, is also higher in the former three program areas than in the latter three. The negative skewness of the compliance ratios indicates that more than half of the compliance ratios exceed the average values presented in Table III-2 (in contrast to PIR variables which typically have positive skewness).

Table III-3 shows the distribution of low, medium, and high compliance cases in each of the program areas.** These tabulations suggest that fewer compliance problems arise in the area of general health services. Conversely, the incidence of low compliance is substantially higher in the areas of parent participation and social services. Finally, the incidence of high compliance is lower in the area of education than in other areas.

It should also be noted that compliance in any particular program area has very little relation to compliance in other areas. This may be seen in Table III-4 which presents correlation coefficients between each of the compliance ratios. In particular, the results suggest that compliance with written items on the SAVI does not guarantee compliance with program items. Similarly, compliance in specific areas such as education need not imply compliance in other program areas such as health, nutrition, and social services. Finally, the correlations indicate that the behavior of total compliance ratios may not be indicative of the behavior of compliance ratios in specific program areas.

C. Determinants of Compliance: Cross-Tabulation Analysis

This section discusses the relationship between program compliance and program characteristics. Two different techniques are used to examine these relationships. This section presents the results of simple cross-tabulations of program compliance with program characteristics. We then examine the relationship between these variables with the aid of multiple regression analysis in Section D.

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*It was felt that compliance with Head Start program items was more important than compliance with written items. Hence, we only report compliance ratios for the program operations component in each of the areas evaluated by the SAVI.

**The classification scheme used to group programs into low, medium, and high compliance categories is discussed later in this chapter.

TABLE III-3

FREQUENCY DISTRIBUTION OF GRANTEES BY COMPLIANCE CATEGORY

Program Area	Compliance Category		
	Low	Medium	High
Education	29.3	27.6	43.1
General Health Services	22.4	13.8	63.8
Mental Health Services	32.8	12.1	55.2
Nutrition Services	27.6	17.2	55.2
Social Services	41.4	6.9	51.7
Parent Participation	43.1	5.2	51.7

TABLE III-4

MATRIX OF CORRELATION COEFFICIENTS BETWEEN COMPLIANCE RATIOS

	Compliance Ratio								
Compliance Ratio	Total	Total Written	Total Program	Education Program	Health Program	Mental Health Program	Nutrition Program	Social Services Program	Parent Partic. Program
Total	1.0	.71	.93	.72	.51	.55	.53	.63	.69
Total Written		1.0	.54	.42	.20	.23	.24	.41	.49
Total Program			1.0	.74	.62	.57	.60	.64	.69
Education Program				1.0	.39	.23	.28	.39	.50
Health Program					1.0	.31	.47	.38	.23
Mental Health Program						1.0	.50	.50	.58
Nutrition Program							1.0	.39	.27
Social Services Program								1.0	.71
Parent Participation Program									1.0

This section presents and summarizes the results of cross-tabulations between Head Start compliance and various program characteristics. In order to construct such cross-tabulations, it is useful to group the cases analyzed into discrete compliance categories. Based on the distribution of cases, it is therefore decided to treat cases as low compliance when the measured compliance ratio was .8 or less; as medium compliance when the measured compliance ratio was between .8 and .9; and as high compliance when the measured compliance ratio exceeded .9. The relatively narrow band of variability in the compliance ratios restricts the ranges of medium and high compliance to only ten percent intervals each.

1. SMSA/Non-SMSA Location and Compliance

Tables III-5 to III-15 present selective results of cross-tabulations between Head Start program characteristics and compliance with SAVI items. The Chi-square statistic at the bottom of each variable measures the strength of the association between compliance and program location. For the number of cases in this analysis, the critical value of this statistic is 4.6.* Values of the Chi-square statistic that exceed 4.6 imply that a significant statistical relationship exists between compliance and location of the program. Values of the Chi-square statistic that are less than 4.6 imply that a statistically significant relationship does not exist.

Examination of Table III-5 indicates that little systematic relation exists between location and overall program operations compliance, although non-SMSA grantees tend to be overrepresented in both low and high compliance categories (indicating more extreme variation than SMSA grantees). Table III-6 shows a significant degree of association between location and nutrition program operations compliance, where non-SMSA's display greater compliance. Other program areas proved to show little relation to program location.

2. Program Type and Compliance

Tables III-7 and III-8 present results of cross-tabulations between compliance and program type. The critical Chi-square value of 4.6 is exceeded in both Tables III-7 and III-8. Part-day programs comprise about 76 percent of the 58 case sample. Of the part-day programs, they comprise only 25.0 percent of the low compliance category in the mental health area (Table III-7) and 20.5 percent of low compliance category in the nutritional services area (Table III-8). Conversely, 24.1 percent of the sample are full-day programs of which 50 percent are in the low

*This is the value at which the null hypothesis of no relationship may be rejected at the ten percent level of significance. Also, in a few of the tables where the cell frequencies are extremely small the Chi-square test may not be appropriate. Since this is a heuristic, exploratory analysis without any definitive results, the tables and categories with very small frequencies are presented.

TABLE III-5

CROSS-TABULATIONS BETWEEN TOTAL PROGRAM COMPLIANCE AND LOCATION OF PROGRAM

Total Program Compliance Ratio	Non-SMSA	SMSA	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	13 37.1%	5 21.7%	18	31.0%
Medium	6 17.1%	9 39.1%	15	25.9%
High	16 45.7%	9 39.1%	25	43.1%
Total Number of Cases in Each Column	35	23	Total Number of Cases:	
Percent of Cases in Each Column	60.3%	39.7%	58	

Chi-Square = 3.79

TABLE III-6

CROSS-TABULATIONS BETWEEN NUTRITION PROGRAM COMPLIANCE AND LOCATION OF PROGRAM

Nutrition Program Compliance Ratio	Non-SMSA	SMSA	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	10 28.6%	6 26.1%	16	27.6%
Medium	3 8.6%	7 30.4%	10	17.2%
High	22 62.9%	10 43.5%	32	55.2%
Total Number of Cases in Each Column	35	23	Total Number of Cases:	
Percent of Cases in Each Column	60.3%	39.7%	58	

Chi-Square = 4.82

TABLE III-7

CROSS-TABULATIONS BETWEEN MENTAL HEALTH PROGRAM COMPLIANCE AND PROGRAM TYPE

Mental Health Program Compliance Ratio	Part-Day	Full-Day	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	11 25.0%	8 57.1%	19	32.8%
Medium	6 13.6%	1 7.1%	7	12.1%
High	27 61.4%	5 35.7%	32	55.2%
Total Number of Cases in Each Column	44	14	Total Number of Cases:	
Percent of Cases in Each Column	75.9%	24.1%	58	

Chi-Square = 4.98

TABLE III-8

CROSS-TABULATIONS BETWEEN NUTRITION PROGRAM COMPLIANCE AND PROGRAM TYPE

Nutrition Program Compliance Ratio	Part-Day	Full-Day	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	9 20.5%	7 50.0%	16	27.6%
Medium	7 15.9%	3 21.4%	10	17.2%
High	28 63.6%	4 28.6%	32	55.2%
Total Number of Cases in Each Column	44	14	Total Number of Cases:	
Percent of Cases in Each Column	75.9%	24.1%	58	

Chi-Square = 5.91

compliance category in the mental health area while 57.1 percent are in the low compliance category in the nutrition services area.

Among high compliance programs in both mental health and nutrition services, part-day programs are overrepresented while full-day programs are underrepresented. Thus, part-day programs are more likely to comply with SAVI performance standards in the program areas of mental health and nutrition services than are full-day programs.

3. Child to Staff Ratio and Compliance

In all program areas except one, the Chi-square statistic falls short of its critical value. The exceptional case is notable, however. Table III-9 shows that the ratio of children to staff does have a significant impact on compliance in the education area. Programs with cases of child to staff ratios of less than 5 comprise only 23.7 percent in the low compliance category in the education area, compared to 40 percent for programs with child to staff ratios of more than 5 in the low compliance category. Thus, the likelihood of low compliance in the education area appears to be inversely related to the child/staff ratio. While programs with low child to staff ratios are less likely to be in low compliance, the results do not indicate that such programs are more likely to be in high compliance. Rather, they are more likely to be in medium compliance than programs with higher child to staff ratios.

4. Education Level of the Staff and Compliance

Tables III-10 and III-11 present cross-tabulations between compliance and the ratio of staff with formal training in preschool education to total paid staff. The latter variable is presumed to measure the educational attainment of the staff. Programs with a ratio of degreed to total staff of .13 or less were designated as programs with "low" staff education levels while programs with a ratio of more than .13 were designated as programs with "high" staff education.*

The Chi-square statistic exceeds its critical value only in the program area of social services. Table III-10 shows that programs with low staff education levels are underrepresented in the high compliance category for social services, and overrepresented in the low compliance category. The reverse is true for programs with higher staff education levels. However, one would not necessarily expect a positive relation between the two variables in the social services area. One would expect staff education to have a significant impact on compliance in the program area of education. Table III-11 indicates that the

* .13 was the average ratio of degreed to total paid staff in the sample.

TABLE III-9

CROSS-TABULATIONS BETWEEN EDUCATION PROGRAM COMPLIANCE AND CHILD TO STAFF RATIO

Education Program Compliance Ratio	Child/Staff Ratio Less Than 5	Child/Staff Ratio More Than 5	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	9 23.7%	8 40.0%	17	29.3%
Medium	15 39.5%	1 5.0%	16	27.6%
High	14 36.8%	11 55.0%	25	43.1%
Total Number of Cases in Each Column	38	20	Total Number of Cases:	
Percent of Cases in Each Column	65.5%	34.5%	58	

Chi-Square = 7.83

TABLE III-10

CROSS-TABULATIONS BETWEEN SOCIAL SERVICES PROGRAM COMPLIANCE AND THE RATIO OF DEGREED TO TOTAL PAID STAFF

Social Services Program Compliance Ratio	Low Degree Ratio*	High Degree Ratio	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	15 45.4%	8 33.3%	23	40.4%
Medium	4 12.1%	0 0 %	4	7.0%
High	14 42.4%	16 66.7%	30	52.6%
Total Number of Cases in Each Column	33	24	Total Number of Cases:	
Percent of Cases in Each Column	57.9%	42.1%	57	

Chi-Square = 4.97

*Less than the average sample ratio of .13.

TABLE III-11

CROSS-TABULATIONS BETWEEN EDUCATION PROGRAM COMPLIANCE AND RATIO OF DEGREED TO TOTAL PAID STAFF

Education Program Compliance Ratio	Low Degree Ratio* Number of Cases/ Column Percent	High Degree Ratio* Number of Cases/ Column Percent	Number of Cases in Each Row	Percent of Cases in Each Row
Low	13 39.4%	4 16.7%	17	29.8%
Medium	8 24.2%	7 29.2%	15	26.3%
High	12 36.4%	13 54.2%	25	43.9%
Total Number of Cases in Each Column	33	24	Total Number of Cases:	
Percent of Cases in Each Column	57.9%	42.1%	57	

Chi-Square = 3.53

*Less than the average sample ratio of .13.

probability of low compliance is reduced, while the probability of high compliance is increased by higher education levels of the Head Start staff, as expected. The relationship is weak from the statistical standpoint. However, it should be noted that this relationship is shown to be stronger in the regression analysis, displayed later in this chapter. Also, the only available measure of staff qualifications from the PIR data base may not be a very satisfactory one.

5. Federal Participation and Compliance

Tables III-12 and III-13 contain results of cross-tabulations between compliance and percent of enrollment funded by ACYF. This variable is used as a proxy for federal participation in Head Start. Programs in which 95 percent or less of ACYF-funded enrollment were grouped together as "low" federal participation, while programs with 95 percent or more ACYF funding were grouped together as "high" federal participation. The Chi-square statistic exceeds its critical value in two compliance areas: total program (Table III-12) and parent participation program (Table III-13). In both cases, federal participation is negatively related to compliance. That is, programs with less federal participation are significantly overrepresented in the high compliance category and significantly underrepresented in the low compliance group.

6. Relationship Between Compliance and Program Size

Finally, Tables III-14 and III-15 present cross-tabulations between compliance and program size. For purposes of this analysis, programs with enrollments of 100 or less were grouped together as "small" programs. Programs with enrollments exceeding 100 were grouped together as "large." Based on the cross-tabulations, program size has a significant impact on education program compliance (Table III-14) and mental health program compliance (Table III-15). Specifically, smaller programs exhibit significantly less incidence of low compliance in the education program area than do larger programs. In contrast, incidence of low compliance in the mental health area is higher among smaller than larger programs.

D. Determinants of Compliance: Regression Analysis

The cross-tabulations just presented are useful because they depict relationships between pairs of variables in a way that is readily interpreted. However, this analysis has important limitations. First, the results may be sensitive to the classification scheme chosen for each of the variables. For example, it is possible the results would change if programs with compliance ratios of .85 or lower were treated as low compliance; programs with compliance ratios between .85 and .95 were treated as medium compliance, and programs with compliance ratios exceeding .95 were treated as high

TABLE III-12

CROSS-TABULATIONS BETWEEN TOTAL PROGRAM COMPLIANCE AND FEDERAL PARTICIPATION

Total Program Compliance Ratio	Low Federal Participation*	High Federal Participation	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	0 0%	18 37.5%	18	31.0%
Medium	4 40.0%	11 22.9%	15	25.9%
High	6 60.0%	19 39.6%	25	43.1%
Total Number of Cases in Each Column	10	48	Total Number of Cases:	
Percent of Cases in Each Column	17.2%	82.8%	58	

Chi-Square = 5.4

*"Low" here implies less than 95 percent of total planned enrollment is ACYF-funded.

TABLE III-13

CROSS-TABULATIONS BETWEEN PARENT PARTICIPATION PROGRAM COMPLIANCE AND FEDERAL PARTICIPATION

Parent Participation Program Compliance Ratio	Low Federal Participation* Number of Cases/ Column Percent	High Federal Participation Number of Cases/ Column Percent	Number of Cases in Each Row	Percent of Cases in Each Row
Low	1 10.0%	24 50.0%	25	43.1%
Medium	0 0%	3 6.3%	3	5.2%
High	9 90.0%	21 43.7%	30	51.7%
Total Number of Cases in Each Column	10	48	Total Number of Cases:	
Percent of Cases in Each Column	17.2%	82.8%	58	

Chi-Square = 7.12

*"Low" here implies less than 95 percent of total planned enrollment is ACYF-funded.

TABLE III-14

CROSS-TABULATIONS BETWEEN EDUCATION PROGRAM COMPLIANCE AND SIZE OF ENROLLMENT

Education Program / Compliance Ratio	Enrollment of 100 or Less Number of Cases/ Column Percent	Enrollment of More Than 100 Number of Cases/ Column Percent	Number of Cases in Each Row	Percent of Cases in Each Row
Low	2 11.8%	15 36.6%	17	29.3%
Medium	8 47.0%	8 19.5%	16	27.6%
High	7 41.2%	18 43.9%	25	43.1%
Total Number of Cases in Each Column	17	41	Total Number of Cases:	
Percent of Cases in Each Column	29.3%	70.7%	58	

Chi-Square = 5.85

TABLE III-15

CROSS-TABULATIONS BETWEEN MENTAL HEALTH PROGRAM COMPLIANCE AND SIZE OF ENROLLMENT

Mental Health Program Compliance Ratio	Enrollment of 100 or Less	Enrollment of More Than 100	Number of Cases in Each Row	Percent of Cases in Each Row
	Number of Cases/ Column Percent	Number of Cases/ Column Percent		
Low	8 47.0%	11 26.8%	19	32.8%
Medium	0 0%	7 17.1%	7	12.1%
High	9 53.0%	23 56.1%	32	55.2%
Total Number of Cases in Each Column	17	41	Total Number of Cases:	
Percent of Cases in Each Column	29.3%	70.7%	58	

Chi-Square = 4.42

compliance. Second, cross-tabulations do not allow one to conveniently analyze the combined impact of several program characteristics on compliance.

For these reasons, it is appropriate to use regression analysis to examine factors related to Head Start compliance. This section reports the results of this analysis.

Tables III-16 and III-17 present the results of simple multiple regressions between Head Start compliance ratios and six program attributes. In each regression, the dependent variable is a specific Head Start compliance ratio. Therefore, each estimated coefficient represents the impact of a particular characteristic on the fraction of SAVI items in compliance, holding other characteristics constant.

Several conclusions may be drawn from the regression estimates presented in Tables III-16 and III-17. First, there is no statistically significant difference in compliance between programs located in SMSA's and those in non-SMSA's. Second, the education level of the paid staff has a positive and significant impact on:

- Total compliance;
- Total program compliance;
- Education program compliance; and
- Social services program compliance.

This result is in marked contrast to the results obtained from the cross-tabulations and illustrates the importance of controlling for the influence of variables other than staff education levels. Third, the frequency of compliance is significantly lower among full-day than part-day programs in three areas:

- Total compliance;
- Nutrition program compliance; and
- Mental health program compliance.

Fourth, program size has a negative impact on compliance in the areas of:

- Education; and
- General health services.

Similarly, the frequency of compliance in the nutrition area is negatively affected by the child to staff ratio. Finally, the percent of enrollment funded by ACYF does not have a significant impact on compliance.

TABLE III-16

REGRESSION ANALYSIS OF THE DETERMINANTS OF TOTAL SAVI COMPLIANCE RATIOS

Independent Variable	SAVI Compliance Ratio (1) Total	(2) Written	(3) Program
SMSA Indicator Non-SMSA = 0 SMSA = 1	-.0068 (.151)	-.028 (.333)	.038 (.846)
Program Type Part Day = 0 Full Day or Both = 1	.091* (1.8)	-.05 (.566)	-.073 (1.44)
Total Enrollment	.000041 (.64)	.000068 (.570)	.000023 (.366)
Child to Staff Ratio	-.0014 (.106)	.0097 (.394)	-.0121 (.911)
Ratio to Staff with Formal Training in Preschool Education to Total Paid Staff	.382** (1.99)	.54 (1.517)	.328* (1.70)
Percent of Enrollment Funded by ACYF	-.10 (.678)	-.46 (1.623)	.0082 (.053)
R^2	.122	.101	.114

*Denotes that the estimated coefficient differs statistically from zero at the .10 level.
**Denotes that the estimated coefficient differs statistically from zero at the .05 level.

The t-statistics are in parentheses.

TABLE III-17

REGRESSION ANALYSIS OF THE DETERMINANTS OF SAVI COMPLIANCE RATIOS FOR COMPONENT AREAS

Independent Variable	SAVI Compliance Ratios (1) Education	(2) Social Services	(3) Parent Participation
SMSA Indicator Non-SMSA = 0 SMSA = 1	.034 (.712)	.082 (.887)	.033 (.328)
Program Type Part Day = 0 Full Day or Both = 1	.0195 (.370)	-.091 (.898)	-.028 (.248)
Total Enrollment	-.000122* (1.82)	.00016 (1.22)	.00011 (.802)
Child to Staff Ratio	.0016 (.117)	.0084 (.313)	-.0127 (.425)
Ratio to Staff with Formal Training in Preschool Education to Total Paid Staff	.397** (1.98)	.872** (2.25)	.361 (.840)
Percent of Enrollment Funded by ACYF	.073 (.453)	-.329 (1.058)	-.438 (1.27)
R^2	.194	.29	.055

*Denotes that the estimated coefficient differs statistically from zero at the .10 level.
**Denotes that the estimated coefficient differs statistically from zero at the .05 level.

The t-statistics are in parentheses.

TABLE III-17 (continued)

Independent Variable	SAVI Compliance Ratios (4) General Health	(5) Mental Health	(6) Nutrition
SMSA Indicator Non-SMSA = 0 SMSA = 1	.0168 (.272)	-.019 (.167)	.054 (.873)
Program Type Part Day = 0 Full Day or Both = 1	-.010 (.154)	-.396** (3.082)	-.217** (3.142)
Total Enrollment	-.00035** (3.96)	.00033** (2.03)	.00017 (1.33)
Child to Staff Ratio	-.011 (.642)	-.0075 (.222)	-.058** (3.169)
Ratio to Staff with Formal Training in Preschool Education to Total Paid Staff	-.049 (.191)	.418 (.859)	.178 (.681)
Percent of Enrollment Funded by ACYF	.293 (1.40)	-.247 (.629)	-.206 (.982)
R^2	.325	.205	.297

*Denotes that the estimated coefficient differs statistically from zero at the .10 level.
**Denotes that the estimated coefficient differs statistically from zero at the .05 level.

The t-statistics are in parentheses.

Tables III-18 and III-19 report estimates obtained from a logit specification of the basic regression model. Because the dependent variable is a compliance ratio or percent, its range is bounded between a minimum value of zero and a maximum value of 1. Failure to take this into account may cause somewhat biased estimates* to be produced by ordinary (least squares) regression analysis. One way of dealing with this issue is to transform the dependent variable into a new variable which is perfectly correlated with the compliance ratio, but which is not bounded in value by either zero or one.

One such transformation may be made by first dividing the fraction of items in compliance by the fraction of items not in compliance and then taking the natural logarithm of this number. This transformation has several attractive features. First, it produces an index that is perfectly correlated with the compliance ratio. Second, it produces an index that is not bounded by either zero or one. Third, it produces an index that may be analyzed by a variant of regression analysis, logit analysis, that has desirable statistical properties.

The results of the logit analysis of compliance are presented in Tables III-18 and III-19. Though the dependent variable is no longer a simple compliance ratio, the interpretation of the coefficients in these tables is analogous to the interpretations given in discussing Tables III-16 and III-17. That is, a significant, positive (negative) coefficient indicates the variable has positive (negative) impact on compliance, holding other factors constant.

The results of the logit analysis are broadly consistent with those of the ordinary regression. However, some important differences should be noted. First, though the estimated coefficient of the ACYF funding variable is negative in both specifications of the total compliance models, it is statistically significant only in the logit regressions. Moreover, in contrast to the ordinary regression estimates, ACYF funding has a significant and positive impact on health program compliance (Table III-19, column (1)). The education level of the paid staff continues to have a significant impact on education compliance, and also has a significant positive impact on nutrition compliance. However, though still positive, the coefficient of the staff education level becomes insignificant in the case of total program compliance and social services program compliance. Total enrollment has a significant impact on compliance in the areas of general and mental health. Finally, location in an SMSA has a significant, positive impact on nutrition compliance in the logit model, whereas the impact is estimated to be statistically insignificant in the ordinary regression model.

*A coefficient estimate is statistically biased if its expected value is not equal to the true population parameter.

TABLE III-18

LOGIT REGRESSION ANALYSIS OF THE DETERMINANTS OF HEAD START COMPLIANCE

Independent Variable	SAVI Item (1) Total	(2) Written	(3) Program
SMSA Indicator Non-SMSA = 0 SMSA = 1	.120 (.431)	-.14 (.403)	.493 (1.61)
Program Type Part Day = 0 Full Day or Both = 1	-.257 (.877)	-.325 (.909)	-.158 (.500)
Total Enrollment	.00034 (.766)	.0007 (.652)	.00013 (.348)
Child to Staff Ratio	.000911 (.010)	.106 (.833)	-.0911 (1.043)
Ratio to Staff with Formal Training in Preschool Education to Total Paid Staff	.0108 (.919)	.754 (.504)	-.871 (.838)
Percent of Enrollment Funded by ACYF	-.018* (1.79)	-.030** (2.26)	.022** (2.16)
R^2	.36	.222	.373

*Denotes that the estimated coefficient differs statistically from zero at the .10 level.
**Denotes that the estimated coefficient differs statistically from zero at the .05 level.

The t-statistics are in parentheses.

TABLE III-19

LOGIT REGRESSION ANALYSIS OF THE DETERMINANTS OF HEAD START COMPLIANCE

Independent Variable	SAVI Item (1) Education	(2) Social Services	(3) Parents Participation
SMSA Indicator Non-SMSA = 0 SMSA = 1	.424 (1.37)	-.276 (.658)	.244 (.54)
Program Type Part Day = 0 Full Day or Both = 1	.455 (1.26)	-.627 (1.36)	.198 (.424)
Total Enrollment	-.00068** (2.05)	.0018 (1.61)	.00081 (1.07)
Child to Staff Ratio	-.029 (.251)	.067 (.483)	-.080 (.551)
Ratio to Staff with Formal Training in Preschool Education to Total Paid Staff	.024* (1.71)	.026 (1.41)	-.010 (.518)
Percent of Enrollment Funded by ACYF	.010 (.014)	-.78 (.44)	-.024 (1.47)
R^2	.456	.41	.377

*Denotes that the estimated coefficient differs statistically from zero at the .10 level.
**Denotes that the estimated coefficient differs statistically from zero at the .05 level.

The t-statistics are in parentheses.

TABLE III-19 (continued)

Independent Variable	SAVI Item (4) General Health	(5) Mental Health	(6) Nutrition
SMSA Indicator Non-SMSA = 0 SMSA = 1	.024 (.058)	.010 (1.526)	.59* (1.69)
Program Type Part Day = 0 Full Day or Both = 1	-.130 (.286)	-.014** (2.36)	-.716** (2.02)
Total Enrollment	.0011 (.448)	.0013 (1.50)	.0003 (.770)
Child to Staff Ratio	-.115 (1.127)	-.272 (1.3)	-.228** (2.48)
Ratio to Staff with Formal Training in Preschool Education to Total Paid Staff	-.857 (.471)	-.909 (.367)	.030** (2.064)
Percent of Enrollment Funded by ACYF	.024** (2.2)	.914 (.551)	.012 (.868)
R^2	.45	.386	.507

*Denotes that the estimated coefficient differs statistically from zero at the .10 level.
**Denotes that the estimated coefficient differs statistically from zero at the .05 level.

The t-statistics are in parentheses.

E. Summary and Conclusions

Alternative statistical methods have been used to analyze the relationship between Head Start compliance and program characteristics. An overview of the findings of these analyses are presented in Tables III-20 to III-22. In each table, an "X" identifies a statistically significant relationship between a particular program characteristic and a particular compliance category.

Though the results vary somewhat with the mode of analysis, several consistent patterns may be discerned. First, compliance with Head Start's education objectives seems to be clearly influenced by program enrollment and program staffing. Second, compliance with Head Start's health objectives is influenced by program type. Third, different attributes are likely to influence compliance more in certain areas than in others.

In view of the limitations of the SAVI data, these conclusions should be viewed as tentative. However, the results of the pilot study are sufficiently promising to warrant further analysis of the relationship between Head Start compliance and program characteristics.

F. Relationship Between Compliance and Program Costs

This chapter concludes with a discussion of the relationship between Head Start compliance and cost. Table III-23 presents correlation coefficients computed between Head Start compliance ratios and total costs per enrolled child. Though the correlations are positive, except for mental health, they are all statistically insignificant.

The results suggest that there may be no significant clustering of Head Start compliance by cost per child. However, the findings of the previous section combined with the cost analysis of Chapter III suggest that increased compliance should have a positive impact on cost per child in specific instances. This would seem to be particularly true in the program area of education. Our analysis has shown that compliance with Head Start's education objectives may be increased by one of the following changes:

- Reducing enrollments;
- Increasing the education level of the paid staff; and
- Lowering the child to staff ratio.

The analysis in Chapter III has shown that each of these changes may have a positive impact on costs per child. Therefore, increasing compliance in the education area may have a positive impact on costs per child.

TABLE III-20

DETERMINANTS OF COMPLIANCE: RESULTS OF CROSS-TABULATION ANALYSIS

Variable	Total Compliance	Total Program Compliance	Total Written Compliance	Education Program Compliance	General Health Program Compliance	Mental Health Program Compliance	Nutrition Program Compliance	Social Services Program Compliance	Parents Participation Program Compliance
SMSA vs Non-SMSA							X		
Full Day vs Part Day						X	X		
Total Enrollment				X		X			
Child to Staff Ratio				X					
Education Level of Staff								X	
Share of Enrollment Funded by ACYF		X							X

TABLE III-21

DETERMINANTS OF COMPLIANCE: RESULTS OF REGRESSION ANALYSIS

Variable	Total Compliance	Total Program Compliance	Total Written Compliance	Education Program Compliance	General Health Program Compliance	Mental Health Program Compliance	Nutrition Program Compliance	Social Services Program Compliance	Parents Participation Program Compliance
SMSA vs Non-SMSA									
Full Day vs Part Day	X					X	X		
Total Enrollment				X	X	X			
Child to Staff Ratio							X		
Education Level of Staff	X	X		X				X	
Share of Enrollment Funded by ACYF									

TABLE III-22

DETERMINANTS OF COMPLIANCE: RESULTS OF LOGIT REGRESSIONS

Variable	Total Compliance	Total Program Compliance	Total Written Compliance	Education Program Compliance	General Health Program Compliance	Mental Health Program Compliance	Nutrition Program Compliance	Social Services Program Compliance	Parents Participation Program Compliance
SMSA vs Non-SMSA							X		
Full Day vs Part Day						X	X		
Total Enrollment				X					
Child to Staff Ratio							X		
Education Level of Staff				X			X		
Share of Enrollment Funded by ACYF	X	X	X		X				

Further analysis of the determinants of compliance based upon larger samples of data may reveal similar relationships of this nature. The small number of cases in our sample and the narrow range of statistical variation in the compliance variables, no doubt, have resulted in much lower levels of statistical significance than what might have been otherwise. Also, while no strong systematic biases are suspected, both the PIR and SAVI data have large degrees of "fuzziness" in them. Larger sample sizes would help to compensate for these drawbacks.

CHAPTER IV

RECOMMENDATIONS FOR SECONDARY DATA ANALYSIS

Data from sources other than the PIR have provided a wealth of valuable information for different analyses in this project. The Survey of Income and Education (SIE) data was instrumental in the distributional impact analysis in Chapter II and the teacher salary data in Volume I, (Final Report). Both could and should be incorporated into an ongoing analytic capability. The Self-Assessment and Validation Instrument (SAVI) data provided the information base for the pilot analysis of program compliance, but it would prove to be rather unsatisfactory from an ongoing perspective. However, an additional one-time analysis of a larger, more representative sample of the SAVI data is recommended.

A. Recommendations for Distributional Impact Analysis

The SIE data has been an excellent source of data to compare the distribution of the population eligible for Head Start with the actual distribution of ACYF resources. Its principle drawback is that it is not available on an annual basis, but only at irregular intervals. For the years that the SIE data are not available, a number of alternatives can be considered. Advice from the Census Bureau could be sought to make annual projections of the 1975 SIE data until the next wave of SIE data becomes available. Another approach is to use a proxy measure of the distribution of eligible children across states. A good proxy measure for this would be the percentage distribution of AFDC (Aid to Families with Dependent Children) recipients across states. As reported in Chapter II, the correlation coefficient between the AFDC variable on recipients and the respective SIE poverty measure on preschool children is a very high .91. The AFDC data could be used also for the distributional impact analysis at the county level, for which SIE data are not available.

Additional analysis and probing for the distributional impact analysis could be made by developing alternative measures of need for Head Start. Health-related indicators, in particular, might be incorporated in this analysis. Measures of nutritional intake for preschool children, for instance, might provide a useful standard of need. Also, morbidity and mortality rates for the three to five years of age group could be considered as benchmarks (although we found little relation between mortality rates for infants and the eligible population of children three to five years of age).

B. Recommendations for Program Compliance Analysis

The SAVI data on program compliance would be too awkward and cumbersome to use in an ongoing, analytic capability for the kind of analysis presented in Chapter III. Almost 400 individual items, many of a very minor nature, are contained in each SAVI report.

The reliability, editing, and coding of so many items for a limited amount of useful, analytic information are severe constraining factors from an ongoing perspective. A new survey instrument would be required for the ongoing capability.

However, the pilot study has revealed sufficient statistical variation in the SAVI data and noteworthy results to warrant an additional one-time analysis on the SAVI data. Since the present sample of SAVI/PIR data is small (58 cases) and non-representative, a new sample of SAVI reports should be drawn. Criteria for the new sample should include: (1) a larger sample size; (2) a more representative sample of categories of particular interest (e.g., CAA's vs. schools). Stratified random sampling would facilitate the fulfillment of these criteria. Problems in terms of the same SAVI form not being used by all grantees and matching SAVI reports with non-missing PIR reports would be encountered in drawing and using a new sample. Also, the discrepancy between PIR reports, which include both grantee and delegate respondents separately, and delegates on an aggregate or cumulative basis only, would have to be addressed.

C. Analytical Use of Annual Audit Data

One final work on the advisability of using Head Start annual audit data is noted here. The use of such data for the kinds of analyses conducted in this project is discouraged. The audit data is much more of an accounting tool than a statistical, social behavior analytic tool. It is used for fiscal management purposes pertaining to cash flow projections, asset and debit statements, and other accounting purposes. The information that it would provide for our analytic purposes would be much too general and too sparse. Also, the formats and layouts of the audit data would not lend themselves to the analyses here.

APPENDIX A

DESCRIPTION OF DISTRIBUTIONAL IMPACT DATA

The PIR data base provides much useful information for analyzing the distribution of Head Start resources, particularly for the distribution and intensity of services within the program. Distributional measures available from the PIR include the number of recipients and Head Start expenditures tabulated according to demographic and geographic categories (as presented in the report).

Important information for assessing distributional impact which is not available from the PIR is estimation of the number of children who are potentially eligible for participation in the Head Start program. This information on the eligible population is used in comparison with PIR measures in order to assess the accessibility of the Head Start Program, as discussed in Chapter IV.

Alternative measures derived from secondary data sources were considered for estimating or representing the extent of the population eligible for Head Start. Careful scrutiny was given to how available these measures might be for different levels of geographically or politically defined areas. These measures include: number (and percent) of children in families below the poverty level; number of recipients and children in families receiving Aid to Families with Dependent Children (AFDC); unemployment rates; infant mortality rates and other birth-related variables; and public assistance expenditures by state and local governments. Each of these measures has its own advantages and drawbacks in terms of their availability and applicability for this study.

The measure which may best approximate the population eligible for Head Start is the number of percent of children in families below the poverty level for 1975. The measure of poverty used in this instance is the one used by the Social Security Administration.* The data source utilized for this measure is: U.S. Bureau of the Census, Survey of Income and Education: 1975 (SIE). This survey shows total number of persons, total number in families below the poverty level, number and percent of total children by state in families below the poverty level and percent of total numbers in the nation in the following categories.

A. Children in all families.

   1. Children in families below povery level less than three years of age.
   2. Children in families below the povery level three to five years of age.

*For a reference source on measurement technique, see: Orshansky, M., The Measurement of Poverty, Technical Paper I: Documentation of Background Information and Rationale for Current Poverty Matrix. U.S. Social Security Administration, Office of Research and Statistics.

B. Children in families with male head of household and numbers below the poverty level in ages under three and three to five years of age.

C. Children in families with female head of household and numbers below the poverty level in ages under three and three to five years of age.

The principle limitation of this source is that it is available only for 1975 and its lowest level of disaggregation is only at the state level.

The AFDC data may serve as a proxy measure for the SIE data at the state level and as a supplemental measure at the county level, should that level of aggregation be desired. One target measure based upon AFDC and Bureau of the Census population data is the proportion of population in a state or county receiving AFDC. The two data sources used in constructing such a measure are:

(1) DHEW, Social and Rehabilitation Service, Recipients of Public Assistance Money Payments and Amounts of Such Payments, by Program, State and County: February, 1976.

(2) Bureau of the Census, Estimates of the Population of Counties and Metropolitan Areas: July 1, 1974 and 1975.

Another measure to represent the target population is the population of the state's total number of AFDC recipients within a given county. This measure then could be compared against a similar distributional measure of Head Start recipients in the state. The absolute level of the AFDC proportion in a given county would not be appropriate for comparison, but variation in these proportions across counties would be appropriate.

Also, note that an AFDC measure pertaining to the age category of children three to five years old would be more appropriate than a measure covering all age categories, but data on this are available only for 29 states at the state level and for 1975 or earlier (based upon a sample survey).

Other measures of public assistance or welfare are available for states, metropolitan areas, and large counties. These data are available in the Government Finances series from the Bureau of the Census. The particular source used in this study is:

- U.S. Bureau of Census, Government Finances in 1975-76: Series FG76, No. 5, U.S. Government Printing Office, Washington, D.C., 1977.

This source presents information on per capita amounts of select items of state and local government finances for 1975-1976, by state. Per capita amounts pertain to such items as: total expenditures, local school expenditures, public welfare expenditures, and health expenditures.

Still another source of information is the Food and Nutrition Service in the Department of Agriculture. This source provides information on counties which operate the special supplemental food program for women, infants and children (WIC). Since these programs are funded on a formula which takes into account special health and nutrition needs, it may be of interest to know where these programs operate in relation to Head Start, particularly the health and nutrition components.

In addition to these sources, we have contacted two state governments, Maryland and Louisiana, to assess the type and amount of data available at the state level. The information includes:

- Prevalance of low birth weight (less than 2500 grams) as the percent of total live births in the county. (The mortality rate for low birth weight infants is 16 times greater.)
- Births to teenage mothers as the percent of total live births in the county.
- Illegitimate births as the percent of the total live births in the county.
- Infant mortality rate per thousand live births for county.
- Infant mortality for the county as the percent of the infant mortality rate for the state.

A principle drawback of these data is the lack of comparability across states for areas smaller than a state since these data would come from a wide variety of sources (e.g., state health departments, other state agencies, universities). Also, the degree of correlation between these measures and the true measure of preschool children in poverty would have to be assessed.